UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/731,799	12/08/2003	Brian A. Hargreaves	STFUP142/S02-300	4317

58766 7590 12/23/2008

Beyer Law Group LLP
P.O. BOX 1687
Cupertino, CA 95015-1687

EXAMINER	
VAUGHN, MEGANN E	
ART UNIT	PAPER NUMBER
2831	
MAIL DATE	DELIVERY MODE
12/23/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/731,799	HARGREAVES, BRIAN A.	
	Examiner	Art Unit	
	MEGANN E. VAUGHN	2831	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 September 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,4 and 18-20* is/are rejected.

7)☒ Claim(s) *5-17* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Allowable Subject Matter

1. The indicated allowability of claims 2-4 are withdrawn in view of the newly discovered reference(s) to Reeder et al (US 2005/0085713). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Deimling (US 6339332).

Regarding claim 1, Deimling discloses in figures 3-7 a method of separating species signals in a composite magnetic resonance imaging signal (Abstract) comprising the steps of: a) applying a series of steady-state free precession (balanced SSFP) pulse sequences (FISP; column 4, lines 55-65), b) measuring magnetic resonance signals during transient periods for the balanced SSFP sequences as steady-state signals evolve (column 4, line 66- column 5, line 2), and c) fitting the transient response of the measured signals to a model to identify the smallest number of discrete exponential terms which provide a satisfactory representation of the measured data (see figures; column 4, lines 21-29).

Deimling discloses the claimed invention except for specifically stating that the evolution of the steady-state in each balance SSFP pulse sequence follows a smooth exponential path. It would have been obvious to one of ordinary skill in the art at the time the invention was made that the evolution of the steady-state in each balance SSFP pulse sequence follows a smooth exponential path since it is known in the art that data naturally decays in a smooth exponential path to reach steady-state.

4. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being obvious over Deimling (US 6339332) in view of Reeder et al (Us 2005/0085713).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing

that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Regarding claim 3 and 4, Deimling discloses the method of separating species signals as stated above in paragraph 3. Deimling does not disclose utilizing a curve-fitting algorithm, specifically non-negative least-squares.

Reeder et al discloses a method of separating species signals in a composite MRI signal wherein a least-squares fitting algorithm is utilized (page 5, claim 1). Therefore it would have been obvious to a person having ordinary skill in the art at the time that the invention was made for Deimling to utilize a least-squares fitting algorithm as taught by Reeder et al since it is a well known method of curve fitting data.

5. Claims 1 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hargreaves et al (*Characterization and Reduction of the Transient Response in Steady-State MR Imaging)*.

Regarding claim 1, Hargreaves et al discloses in figures 10 and 11 a method of separating species signals in a composite magnetic resonance imaging signal comprising the steps of: a) applying a series of steady-state free precession (balanced SSFP) pulse sequences (pages 153-154, *Experimental Methods;* figure 9), b) measuring magnetic resonance signals during transient periods for the balanced SSFP sequences as steady-state signals evolve (pages 153-154, *Experimental Methods;* figure 10 or 11), and c) fitting the transient response of the measured signals to a model

to identify the smallest number of discrete exponential terms which provide a satisfactory representation of the measured data (see figures 10 and 11).

Hargreaves et al discloses the claimed invention except for specifically stating that the evolution of the steady-state in each balance SSFP pulse sequence follows a smooth exponential path. It would have been obvious to one of ordinary skill in the art at the time the invention was made that the evolution of the steady-state in each balance SSFP pulse sequence follows a smooth exponential path since it is known in the art that data naturally decays in a smooth exponential path to reach steady-state.

Regarding claim 18, Hargreaves et al discloses that before step a) a plurality of preparation pulses are applied, wherein an inversion pulse is applied with the preparation pulses and magnetization starts at a negative value (page 153, *Catalyzing Refocused-SSFP;* figure 9*)*.

Regarding claim 19, Hargreaves et al discloses that before step a) a plurality of preparation pulses are applied and magnetization is saturated thereby (page 153, *Catalyzing Refocused-SSFP;* figure 9*)*.

Regarding claim 20, Hargreaves et al discloses that before step a) a plurality of preparation pulses are applied and magnetization starts in a steady state and is inverted in the steady state (page 153, *Catalyzing Refocused-SSFP;* figure 9*)*.

Allowable Subject Matter

6. Claims 5-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is an examiner's statement of reasons for allowance:

Claims 5-17 are allowable over the prior art of record because the prior art of record does not teach or disclose a method of separating species signals in a composite magnetic resonance imaging signal wherein the model is defined by the equation in claims 5 and 17, in combination with the remaining limitations of the claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MEGANN E. VAUGHN whose telephone number is (571)272-8927. The examiner can normally be reached on 8 am- 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on 571-272-2245. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MEV
Patent Examiner Art Unit 2831
12/21/2008

/Diego Gutierrez/
Supervisory Patent Examiner,
Art Unit 2831